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# The crystal structure of deerite

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## Abstract

The crystal structure of deerite [$P2_1/a$, $a$ = 10.786(8), $b$ = 18.88(2), $c$ = 9.564(9)A, $\beta$ = 107.45(5)°] from Panoche, California, has been investigated using intensity data collected with Mo$K\alpha$ radiation on a Picker FACS I diffractometer. The structure of the pseudocell with $c' = c/3$ and space group $P2_1/a$ has been determined and refined to a weighted residual index of 0.07. The pseudocell structure has disordered Si and oxygen positions, and there are only three possible ordered arrangements of these: the preferred full structure of deerite has a weighted residual index of 0.08, but it was not possible to refine it. The ideal structural formula is $Fe^{2+}_6Fe^{3+}_3O_3[Si_6O_{17}](OH)_5$, $Z$ = 4. The structure is formed of two structural units continuous along the $c$-axis direction: (1) a strip of edge-sharing $M$-atom octahedra, six octahedra in width, oriented parallel to {110}, and (2) a hybrid single-double $[Si_6O_{17}]$ silicate chain. Apical and lateral oxygens of the silicate chain are shared with $M$ octahedra, but the familiar sandwich of tetrahedral–octahedral–tetrahedral coordination polyhedra is not well developed. The basal tetrahedral oxygens enclose a structural void. $Fe^{3+}$ probably occupies the lateral sites in the octahedral strip.

Similar structural units have been reported recently for howieite, which is associated with deerite in rocks of the Franciscan Formation. The arrangement of the silicate chain in chain-silicate structures is constrained by the close-packed oxygen distances in the octahedral strip. This constraint results in a distinctly different structural topology in deerite and howieite compared to pyroxene and amphibole and imparts a characteristic distortion to the silicate chain. In particular, the sides of the six-membered rings in both deerite and howieite are buckled inward.

## Introduction

Deerite (along with howieite and zussmanite) occurs in blocks of riebeckite–stilpnomelane schists within metasediments of the Franciscan Formation, California. The type locality is the Laytonville quarry, Mendocino County (Agrell *et al.*, 1965). Deerite has also been reported in stilpnomelane schists, associated with glaucophane schists, in the French and Italian Alps (for example, Agrell and Gay, 1970).

Deerite is a hydrous ferrous, ferric silicate: the proposed formula for a half unit-cell content with (O,OH) = 50 is $(Mg_{0.08}Mn_{0.86}Fe^{2+}_{10.90})_{11.84}(Fe^{3+}_{5.89}Al_{0.38})_{6.27}Si_{11.86}O_{39.95}(OH)_{10.05}$ (Agrell *et al.*, 1967, footnote by Agrell). Agrell *et al.* (1965) report that it is monoclinic, space group $P2_1/a$, with $a$ = 10.755(2), $b$ = 18.870(6), $c$ = 9.568(2)A, $\beta$ = 107.12(4)°, density 3.837 gm cm$^{-3}$. It forms black acicular crystals, elongated parallel to $c$ and lozenge-shaped in cross section, with a good {110} cleavage. The crystals are twinned submicroscopically: the twin axis is [001]. More recently, Wenk (1974) has suggested that deerite is in fact orthorhombic, space group *Pnma*, with $a$ = 18.885, $b$ = 3.182 (needle axis), $c$ = 10.337A.

Characteristic Mössbauer spectra and magnetic susceptibility data for deerite have been reported by several laboratories, and the initial interpretations of these data resulted in a certain amount of controversy. Bancroft *et al.*, (1968) interpreted their room-temperature Mössbauer spectrum in terms of three quadrupole doublets: $A,A'$, assigned to $Fe^{2+}$ in sixfold coordination; $B,B'$, assigned to $Fe^{3+}$ in sixfold coordination; $C,C'$, assigned to $Fe^{2+}$ in a distorted fourfold coordination. The fraction of the total Fe content of deerite accommodated in each of the sites, or group of sites, associated with these doublets is approximately 0.47, 0.37, and 0.16, respectively. In a subsequent Mössbauer study, Frank and Bunbury

Table 4. Observed and Calculated Structure Factors

| K | L | $F_o$ | $F_c$ | K | L | $F_o$ | $F_c$ | K | L | $F_o$ | $F_c$ | K | L | $F_o$ | $F_c$ | K | L | $F_o$ | $F_c$ | K | L | $F_o$ | $F_c$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | H = 0 | | | 8 | 0 | 254 | 276 | | -3 | 399 | 386 | 3 | 0 | 551 | 603 | | -1 | 93 | 121 | | -6 | 78 | 31 |
| 1 | 9 | 177 | 224 | | 6 | 72 | 13 | | -9 | 120 | 149 | | 1 | 69 | 71 | | -3 | 185 | 180 | 17 | -3 | 145 | 166 |
| 2 | 6 | 137 | 133 | | -3 | 67 | 76 | 6 | 0 | 259 | 291 | | 5 | 72 | 7 | | -6 | 99 | 93 | 18 | 4 | 85 | 10 |
| 3 | 3 | 96 | 104 | | -4 | 76 | 78 | | 3 | 241 | 238 | | 6 | 216 | 222 | 1 | 3 | 213 | 211 | 19 | 0 | 206 | 227 |
| 4 | 3 | 225 | 230 | | -6 | 232 | 214 | | 9 | 85 | 68 | | -3 | 80 | 44 | | 9 | 86 | 43 | 20 | -3 | 84 | 81 |
| 5 | 3 | 387 | 384 | 9 | 0 | 172 | 194 | 7 | 3 | 452 | 444 | 4 | 0 | 236 | 252 | | -3 | 370 | 382 | | | | |
| | 6 | 118 | 108 | | 3 | 301 | 307 | | -3 | 143 | 139 | | 9 | 144 | 172 | | -6 | 82 | 28 | | H = 5 | | |
| 6 | 0 | 127 | 151 | | -6 | 82 | 94 | 8 | 3 | 120 | 107 | | -7 | 73 | 66 | 2 | 0 | 146 | 159 | | | | |
| | 1 | 85 | 128 | | -9 | 104 | 135 | | -2 | 65 | 7 | | -9 | 374 | 433 | | 6 | 290 | 289 | 1 | 0 | 124 | 136 |
| | 6 | 213 | 195 | 10 | 3 | 403 | 385 | | -3 | 73 | 74 | 5 | 0 | 500 | 547 | | 9 | 143 | 120 | | 3 | 299 | 310 |
| | 9 | 95 | 127 | | 6 | 147 | 139 | | -6 | 367 | 339 | | 3 | 89 | 54 | | -3 | 140 | 142 | | -1 | 64 | 53 |
| 7 | 3 | 143 | 137 | | -9 | 186 | 213 | 9 | 0 | 112 | 122 | | 9 | 83 | 41 | | -6 | 140 | 146 | | -3 | 156 | 146 |
| | 9 | 182 | 205 | 11 | 0 | 100 | 114 | | 3 | 596 | 571 | | -3 | 216 | 198 | | -7 | 71 | 51 | 2 | 0 | 93 | 114 |
| 8 | 0 | 267 | 307 | | 6 | 231 | 222 | | -3 | 66 | 54 | 6 | 0 | 141 | 148 | 3 | 0 | 201 | 208 | | 3 | 345 | 347 |
| 9 | 9 | 227 | 283 | | -6 | 75 | 67 | 10 | 0 | 119 | 124 | | 3 | 134 | 129 | | 3 | 116 | 106 | | 6 | 104 | 79 |
| 10 | 0 | 197 | 200 | 12 | -3 | 317 | 310 | | 6 | 81 | 76 | | 9 | 110 | 117 | | 6 | 225 | 217 | | -3 | 180 | 185 |
| | 3 | 114 | 123 | 13 | 6 | 209 | 247 | | -3 | 143 | 134 | | -3 | 242 | 243 | | -9 | 86 | 86 | | -5 | 69 | 19 |
| 11 | 2 | 67 | 52 | 14 | 0 | 177 | 180 | | -6 | 128 | 120 | | -4 | 74 | 69 | 4 | 0 | 332 | 336 | | -6 | 162 | 175 |
| | 3 | 191 | 181 | | 6 | 78 | 19 | 11 | 0 | 181 | 172 | | -9 | 120 | 120 | | -3 | 68 | 56 | | -9 | 76 | 54 |
| | 6 | 134 | 134 | | -3 | 129 | 129 | | 6 | 280 | 280 | 7 | 3 | 382 | 372 | | -9 | 100 | 120 | 3 | 0 | 327 | 318 |
| 12 | 0 | 120 | 124 | | -6 | 117 | 144 | | -2 | 67 | 65 | | 9 | 108 | 95 | 5 | 0 | 93 | 104 | | -3 | 106 | 90 |
| | 3 | 258 | 256 | 15 | 0 | 150 | 167 | | -3 | 177 | 177 | 8 | -5 | 68 | 24 | | 3 | 121 | 127 | | -6 | 310 | 315 |
| | 6 | 103 | 85 | | 3 | 79 | 85 | | -6 | 72 | 17 | | -6 | 217 | 208 | | 6 | 149 | 158 | 4 | 0 | 82 | 92 |
| 13 | 3 | 106 | 95 | | -6 | 119 | 154 | 12 | 0 | 74 | 82 | 9 | 0 | 94 | 105 | | -6 | 112 | 116 | | 3 | 309 | 324 |
| | 6 | 193 | 175 | 16 | 0 | 318 | 310 | | -3 | 258 | 261 | | 6 | 95 | 88 | | -9 | 128 | 152 | | 6 | 91 | 104 |
| 14 | 6 | 177 | 224 | | -6 | 179 | 215 | | -6 | 89 | 88 | | -3 | 305 | 296 | 6 | 3 | 139 | 147 | | -4 | 89 | 43 |
| 16 | 0 | 329 | 323 | 17 | 3 | 121 | 142 | | -9 | 140 | 145 | | -6 | 99 | 95 | | 6 | 161 | 150 | | -6 | 146 | 154 |
| 18 | 0 | 166 | 169 | 18 | 3 | 98 | 112 | 13 | 0 | 253 | 251 | | -9 | 81 | 15 | | -3 | 240 | 231 | | -7 | 71 | 22 |
| | 3 | 115 | 141 | 21 | 0 | 91 | 79 | | 2 | 76 | 50 | 10 | 0 | 163 | 174 | | -6 | 218 | 198 | 5 | -6 | 422 | 431 |
| 20 | 0 | 133 | 134 | | 3 | 124 | 156 | | 3 | 95 | 92 | | 6 | 126 | 159 | 7 | 3 | 152 | 161 | 6 | 3 | 210 | 209 |
| | 3 | 161 | 213 | | -2 | 87 | 10 | | 6 | 91 | 99 | | -3 | 403 | 397 | | 6 | 87 | 98 | | 4 | 80 | 64 |
| 22 | 3 | 107 | 92 | 22 | -3 | 120 | 153 | | -3 | 115 | 95 | 11 | 0 | 248 | 249 | | -3 | 449 | 451 | | 6 | 115 | 141 |
| | | | | | | | | 14 | 0 | 325 | 321 | 12 | 6 | 98 | 149 | 8 | 3 | 114 | 120 | | -3 | 145 | 135 |
| | H = 1 | | | | H = 2 | | | 15 | 5 | 73 | 22 | | -9 | 156 | 179 | | 6 | 178 | 219 | | -6 | 121 | 115 |
| | | | | | | | | 16 | 0 | 87 | 53 | 13 | 0 | 383 | 390 | | -3 | 114 | 109 | | -9 | 96 | 120 |
| 1 | 0 | 235 | 278 | 0 | 0 | 149 | 129 | | -6 | 157 | 198 | 14 | 6 | 95 | 86 | | -6 | 85 | 56 | 7 | 0 | 112 | 98 |
| | 5 | 70 | 32 | | 3 | 178 | 180 | 17 | 0 | 116 | 104 | | -6 | 134 | 134 | 9 | 0 | 98 | 94 | | 3 | 185 | 172 |
| | -6 | 237 | 230 | | 7 | 79 | 80 | | 3 | 142 | 159 | 15 | 0 | 69 | 13 | | -3 | 578 | 571 | | 6 | 91 | 86 |
| | 3 | 76 | 108 | | -6 | 978 | 959 | 18 | -3 | 98 | 128 | | 3 | 296 | 278 | 10 | 0 | 123 | 144 | | -3 | 374 | 370 |
| | 6 | 178 | 184 | 1 | 3 | 372 | 372 | | -6 | 101 | 134 | | -6 | 123 | 156 | | 6 | 92 | 113 | 9 | 0 | 135 | 126 |
| 3 | 6 | 325 | 312 | | 9 | 101 | 94 | 20 | 3 | 96 | 92 | 16 | -6 | 213 | 215 | | -3 | 98 | 73 | | 3 | 80 | 76 |
| 4 | 3 | 74 | 70 | | -9 | 82 | 19 | | -3 | 183 | 204 | 17 | 1 | 69 | 20 | | -6 | 85 | 59 | | -9 | 112 | 139 |
| | 6 | 154 | 160 | 2 | 0 | 161 | 192 | 21 | 0 | 95 | 112 | | 3 | 132 | 138 | | -9 | 90 | 72 | 10 | 0 | 204 | 213 |
| | -1 | 96 | 130 | | 1 | 68 | 108 | | 4 | 86 | 16 | | -3 | 132 | 151 | 11 | 0 | 353 | 378 | | 3 | 80 | 48 |
| | -3 | 885 | 903 | | 3 | 162 | 163 | 22 | -3 | 92 | 101 | 18 | 6 | 156 | 155 | | -6 | 110 | 137 | | -6 | 122 | 144 |
| 5 | 1 | 92 | 101 | | 6 | 137 | 138 | | | | | | -3 | 110 | 109 | 12 | 0 | 203 | 218 | | -9 | 189 | 220 |
| | 3 | 215 | 200 | | -6 | 153 | 138 | | H = 3 | | | 19 | -5 | 84 | 14 | | 4 | 79 | 18 | 11 | 3 | 112 | 100 |
| | 6 | 438 | 431 | 3 | 3 | 77 | 50 | | | | | 20 | -3 | 96 | 67 | | -6 | 89 | 92 | | -6 | 194 | 217 |
| | -7 | 78 | 52 | | 6 | 177 | 166 | 1 | 3 | 156 | 138 | 21 | -3 | 149 | 163 | | -9 | 128 | 145 | 12 | 0 | 213 | 235 |
| 6 | 3 | 257 | 246 | | -3 | 87 | 114 | | 6 | 119 | 91 | | -4 | 88 | 14 | 13 | 0 | 143 | 170 | | 3 | 216 | 213 |
| | 6 | 105 | 121 | 4 | 0 | 71 | 93 | | 9 | 124 | 171 | | | | | | 3 | 88 | 60 | 13 | 3 | 111 | 123 |
| | -3 | 319 | 317 | | 6 | 109 | 103 | | -6 | 236 | 235 | | H = 4 | | | | -6 | 148 | 168 | | 6 | 99 | 83 |
| | -9 | 105 | 123 | | -3 | 233 | 235 | 2 | 0 | 308 | 329 | | | | | 14 | 3 | 180 | 204 | | -6 | 238 | 259 |
| 7 | 0 | 118 | 121 | | -6 | 71 | 43 | | 3 | 200 | 191 | 0 | 1 | 74 | 117 | | -6 | 196 | 235 | 14 | 0 | 94 | 78 |
| | 6 | 79 | 48 | | -9 | 104 | 112 | | 9 | 153 | 193 | | 3 | 122 | 110 | 15 | -4 | 81 | 26 | | 3 | 145 | 150 |
| | 9 | 178 | 194 | 5 | 0 | 150 | 171 | | -3 | 90 | 97 | | 6 | 239 | 239 | 16 | 3 | 130 | 174 | 15 | -3 | 253 | 277 |

Table 4. cont.

| K | L | $F_o$ | $F_c$ | K | L | $F_o$ | $F_c$ | K | L | $F_o$ | $F_c$ | K | L | $F_o$ | $F_c$ | K | L | $F_o$ | $F_c$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17 | 3 | 94 | 64 | | 3 | 92 | 96 | | -6 | 239 | 230 | 5 | 0 | 170 | 159 | | | | |
| | -3 | 141 | 131 | 18 | 0 | 120 | 101 | 1 | 3 | 194 | 175 | 5 | -3 | 89 | 75 | | H = 11 | | |
| 18 | 0 | 180 | 188 | | -3 | 93 | 99 | | -3 | 74 | 75 | | -6 | 117 | 97 | | | | |
| 19 | 0 | 113 | 98 | 19 | -6 | 161 | 178 | 2 | 0 | 99 | 90 | 6 | 0 | 83 | 47 | 1 | -6 | 145 | 111 |
| | 3 | 107 | 109 | | | | | | 3 | 104 | 94 | | 2 | 80 | 17 | 2 | 3 | 166 | 181 |
| | | | | | H = 7 | | | | 6 | 97 | 34 | | -6 | 162 | 153 | | -3 | 170 | 156 |
| | H = 6 | | | | | | | | -3 | 241 | 227 | | -9 | 130 | 111 | | -4 | 78 | 5 |
| | | | | 1 | 0 | 102 | 103 | | -6 | 290 | 285 | 7 | 0 | 280 | 262 | | -6 | 91 | 89 |
| 0 | 0 | 404 | 397 | | 6 | 118 | 118 | 3 | 3 | 224 | 192 | | 2 | 30 | 10 | 3 | 0 | 157 | 136 |
| | 3 | 245 | 265 | | -3 | 312 | 309 | | -3 | 196 | 185 | | 3 | 108 | 79 | | 3 | 103 | 102 |
| | -3 | 113 | 106 | | -6 | 106 | 111 | | -6 | 217 | 213 | | -4 | 87 | 69 | | -6 | 155 | 133 |
| | -5 | 79 | 36 | | -9 | 84 | 77 | 4 | -3 | 112 | 84 | | -6 | 104 | 79 | 4 | -3 | 170 | 149 |
| | -9 | 81 | 85 | 2 | 0 | 165 | 151 | 5 | 0 | 154 | 135 | | -9 | 110 | 103 | | -9 | 117 | 86 |
| 1 | -3 | 209 | 203 | | -3 | 368 | 350 | | 3 | 175 | 170 | 8 | -3 | 99 | 82 | 5 | 0 | 191 | 166 |
| | -9 | 225 | 229 | 3 | -6 | 231 | 230 | | -6 | 154 | 156 | | -6 | 125 | 130 | | -6 | 164 | 135 |
| 2 | 0 | 392 | 386 | 4 | 0 | 154 | 139 | 6 | 0 | 89 | 83 | 9 | 0 | 201 | 169 | | -7 | 90 | 3 |
| | 3 | 214 | 220 | | 3 | 123 | 145 | | 3 | 167 | 174 | | -3 | 113 | 98 | 6 | -6 | 89 | 50 |
| | -6 | 150 | 144 | | -2 | 68 | 23 | | 6 | 142 | 139 | 10 | 0 | 251 | 213 | 7 | 1 | 78 | 13 |
| | -9 | 111 | 75 | | -3 | 337 | 335 | | -6 | 127 | 134 | 11 | 0 | 156 | 153 | | -6 | 208 | 193 |
| 3 | 0 | 294 | 381 | 5 | 0 | 104 | 99 | 7 | 3 | 149 | 148 | | 3 | 85 | 47 | 9 | -3 | 93 | 52 |
| | 3 | 193 | 184 | | 6 | 110 | 121 | | -6 | 105 | 93 | 12 | -3 | 212 | 195 | | -6 | 131 | 121 |
| | -3 | 116 | 119 | 6 | 0 | 194 | 165 | | -9 | 96 | 98 | 13 | -3 | 127 | 120 | 10 | -3 | 91 | 79 |
| | -6 | 154 | 166 | | -3 | 209 | 200 | 8 | 0 | 273 | 284 | | -6 | 85 | 65 | | -6 | 206 | 193 |
| 4 | 3 | 85 | 90 | | -9 | 104 | 87 | | -6 | 243 | 235 | 14 | -6 | 121 | 101 | | -7 | 88 | 1 |
| | -4 | 87 | 104 | 7 | 6 | 167 | 191 | 9 | 0 | 203 | 191 | 15 | -4 | 84 | 5 | 11 | 0 | 99 | 76 |
| | -6 | 102 | 105 | | -3 | 183 | 176 | | 3 | 131 | 121 | 16 | -3 | 99 | 82 | | -6 | 145 | 126 |
| 5 | 0 | 268 | 259 | | -9 | 195 | 192 | 10 | -3 | 157 | 140 | | | H = 10 | | 12 | -3 | 87 | 53 |
| | -3 | 107 | 116 | 8 | 0 | 166 | 165 | | -6 | 127 | 117 | | | | | 13 | -3 | 121 | 102 |
| | -10 | 82 | 14 | | 3 | 83 | 90 | 11 | 3 | 141 | 140 | 0 | 0 | 187 | 193 | | | | |
| 6 | 0 | 221 | 232 | | -3 | 92 | 68 | | -6 | 120 | 95 | | 1 | 94 | 10 | | H = 12 | | |
| | -3 | 148 | 142 | 9 | 6 | 105 | 131 | 12 | 0 | 89 | 100 | | -9 | 118 | 123 | | | | |
| | -9 | 138 | 125 | | -6 | 87 | 82 | | -3 | 202 | 196 | 1 | 3 | 155 | 179 | 0 | 0 | 103 | 67 |
| 7 | 0 | 104 | 106 | 10 | 6 | 165 | 188 | 13 | 0 | 127 | 111 | | -3 | 193 | 183 | | -3 | 113 | 104 |
| | -3 | 172 | 162 | | -5 | 74 | 20 | | -6 | 104 | 73 | 2 | 0 | 87 | 70 | | -6 | 110 | 121 |
| | -9 | 195 | 208 | | -6 | 159 | 162 | 14 | 3 | 183 | 181 | | -9 | 136 | 126 | 1 | 0 | 116 | 98 |
| 8 | 0 | 289 | 266 | 11 | 0 | 80 | 34 | | -6 | 90 | 73 | 3 | -3 | 216 | 191 | | -3 | 210 | 182 |
| | 6 | 142 | 194 | | 6 | 100 | 123 | | -7 | 85 | 13 | 5 | -3 | 189 | 173 | 2 | 0 | 140 | 133 |
| | -3 | 127 | 123 | | -2 | 73 | 44 | 15 | 3 | 154 | 132 | | -6 | 89 | 81 | 3 | -6 | 105 | 57 |
| | -9 | 88 | 66 | | -3 | 98 | 98 | 16 | -6 | 102 | 82 | | -7 | 87 | 9 | 5 | 0 | 109 | 73 |
| 9 | 3 | 101 | 108 | 12 | 3 | 174 | 188 | 18 | -3 | 130 | 114 | 6 | 0 | 175 | 153 | 6 | 0 | 208 | 183 |
| | 6 | 86 | 119 | | -3 | 222 | 207 | | | | | | -3 | 187 | 178 | | -6 | 136 | 138 |
| | -9 | 273 | 296 | | -6 | 143 | 153 | | | H = 9 | | | -6 | 108 | 76 | 7 | 0 | 114 | 91 |
| 10 | 0 | 183 | 169 | 13 | 0 | 96 | 113 | | | | | 7 | -3 | 157 | 151 | | | | |
| | 3 | 149 | 142 | | -3 | 117 | 123 | 1 | 0 | 142 | 137 | 8 | -5 | 80 | 23 | | H = 13 | | |
| 11 | 0 | 138 | 128 | 14 | 0 | 166 | 154 | | -9 | 167 | 165 | | -6 | 208 | 197 | | | | |
| | -6 | 247 | 265 | | -3 | 177 | 154 | 2 | 0 | 162 | 146 | 9 | 0 | 94 | 58 | 2 | -3 | 209 | 178 |
| 12 | 3 | 181 | 188 | | -6 | 85 | 87 | | 3 | 153 | 154 | | 3 | 92 | 78 | 3 | -3 | 151 | 110 |
| | -6 | 118 | 108 | 15 | -3 | 94 | 85 | | -3 | 140 | 109 | | -3 | 137 | 116 | | -6 | 149 | 117 |
| 13 | -3 | 81 | 71 | | -7 | 98 | 10 | | -6 | 84 | 79 | | -6 | 120 | 116 | 6 | -3 | 100 | 98 |
| | -6 | 84 | 101 | 16 | 0 | 185 | 191 | | -9 | 199 | 187 | 11 | 0 | 146 | 130 | 6 | -4 | 96 | 21 |
| 14 | -3 | 206 | 208 | | 3 | 91 | 74 | 3 | 0 | 202 | 190 | | 2 | 86 | 12 | | | | |
| 15 | 0 | 99 | 100 | 18 | -6 | 184 | 152 | | -8 | 80 | 19 | | -3 | 108 | 137 | | | | |
| | -3 | 108 | 85 | | | | | 4 | 3 | 164 | 156 | 12 | -6 | 85 | 86 | | | | |
| 16 | 0 | 145 | 127 | | H = 8 | | | | -3 | 151 | 137 | 13 | -6 | 146 | 95 | | | | |
| | -3 | 170 | 168 | | | | | | -6 | 93 | 106 | 14 | -3 | 206 | 181 | | | | |
| 17 | 0 | 117 | 127 | 0 | -3 | 265 | 251 | | -9 | 194 | 183 | 15 | -3 | 141 | 123 | | | | |